

What is claimed is:

1. An apparatus for calibrating voltage spikes used in testing an electrical device, comprising:

a circuit having a plurality of phase voltage lines and a ground line, a plurality of phase voltage inputs and a ground input adapted for connection to a power source, each phase voltage input being connectable to a corresponding phase voltage line and the ground input being connected to the ground line, and a plurality of phase voltage outputs and a ground output adapted for connection to an electrical device under test, each phase voltage output being connected to a corresponding phase voltage line and the ground output being connected to the ground line;

a selection circuit joined to the plurality of phase voltage lines for selecting one of the phase voltage lines and providing a synchronization voltage signal based on voltage signals across the phase voltage lines not selected by the selection circuit;

a voltage spike generator joined to the selection circuit to receive the synchronization voltage signal for generating a predetermined voltage spike waveform based on the synchronization voltage signal; and

additional circuitry joined to the voltage spike generator and the phase voltage lines and joined to said phase voltage outputs and said ground output for applying the predetermined voltage spike waveform across the selected phase voltage line and the ground line.

2. The apparatus according to claim 1 further comprising a capacitive circuit comprising a plurality of capacitor networks joined to the selection circuit, each capacitor network having a variable capacitance such that the capacitor network exhibits any one of a plurality of capacitances, each capacitor network corresponding to a particular phase voltage line.

3. The apparatus according to claim 2 wherein the selection circuit is configured to disconnect the capacitor network corresponding to the selected phase voltage line, connect the capacitor network corresponding to one of the

phase voltage lines not selected to the ground line, connect a further one of the capacitor networks corresponding to the remaining phase voltage line not selected to the ground line, and wherein the phase voltage lines that are not selected provide a voltage signal that defines the synchronization signal and has waveform characteristics that are formed by the capacitance exhibited by the capacitor networks corresponding to the phase voltage lines not selected.

4. The apparatus according to claim 2 wherein each capacitor network comprises:

a plurality of capacitors; and

a switch joined to said plurality of capacitors for selectively activating at least one of said plurality of capacitors to provide a resulting capacitance that is to be exhibited by the capacitor network.

5. The apparatus according to claim 4 wherein when the switch selectively activates more than one of said plurality of capacitors, said selectively activated capacitors are connected in parallel.

6. The apparatus according to claim 1 further comprising a monitoring circuit joined to said voltage spike generator for monitoring the predetermined voltage spike waveform.

7. A method for calibrating voltage spikes used in testing an electrical device, comprising:

providing a three-phase electrical device to be tested;

providing a three-phase power source;

providing a circuit having a plurality of phase voltage lines and a ground line;

connecting the phase voltage lines between the three-phase power source and the electrical device under test;

selecting one of the phase voltage lines;

generating a synchronization voltage signal based on voltage signals across the phase voltage lines not selected;

generating a voltage spike waveform based on the  
synchronization voltage signal, the voltage spike  
waveform having variable waveform characteristics;  
and

applying the voltage spike waveform across the selected  
phase voltage line and the ground line.

8. The method according to claim 7 further wherein the  
step of generating the voltage spike waveform includes the  
step of adjusting the waveform characteristics of the  
voltage spike waveform.

9. The method according to claim 8 further comprising  
providing a capacitive circuit having a plurality of  
capacitor networks, each capacitive network having a  
variable capacitance such that the capacitor network  
exhibits any one of a plurality of capacitances, each  
capacitor network corresponding to a particular phase  
voltage line, and wherein the step of adjusting comprises  
changing the capacitances of the capacitor networks  
corresponding to the phase voltage lines not selected.

10. The method according to claim 7 further comprising  
monitoring the predetermined voltage spike waveform.